

20020503.qrp v02_n544.qrl.20020503

Date: Fri, 3 May 2002 19:03:13 EDT
From: qrp-l@Lehigh.EDU
To: "Low Power Amateur Radio Discussion" <qrp-l@Lehigh.EDU>
Subject: QRP-L digest 2544

QRP-L Digest 2544

Topics covered in this issue include:

- 1) [125913] Those Pesky Texans
by Paul Womble <pwomble1@tampabay.rr.com>
- 2) [125914] Re: Flying Horse 2001 CD-ROM
by "Ron Polityka" <wb3aal@fast.net>
- 3) [125915] Re: Biasing MOSFETS?
by "Glen Leinweber" <leinwebe@mcmail.cis.mcmaster.ca>
- 4) [125916] birdie calculations
by n5ib@juno.com
- 5) [125917] Re: birdie calculations
by "Pat J. Whelton" <pwhelton@hal-pc.org>
- 6) [125918] WTB Z-11 tuner
by "w5tb" <w5tb@arrl.net>
- 7) [125919] Nash Equilibrium and Antennas (was Re: Antenna Impedance)
by "Marty N5NW" <n5nw@n5nw.org>
- 8) [125920] Spartan Sprint?
by ARDUJENSKI@aol.com
- 9) [125921] RE: Nash Equilibrium and Antennas (was Re: Antenna Impedance)
by "Marty N5NW" <n5nw@n5nw.org>
- 10) [125922] Re: Nash Equilibrium and Antennas (was Re: Antenna Impedance)
by "James R. Duffey" <jamesd1@flash.net>
- 11) [125923] Trade or swap
by Mercxx@aol.com
- 12) [125924] Trade??
by Ed Kessler <edkess@pa.net>
- 13) [125925] Don't Miss Monday's May Spartan Sprint
by Richard Fisher <ki6sn@yahoo.com>
- 14) [125926] FS (OT) - QRP rigs for sale
by Dennis Doran <wb8wtu@yahoo.com>
- 15) [125927] More MOSFET stuff
by na5n@zianet.com
- 16) [125928] Re: More MOSFET stuff
by K5BDZ@aol.com
- 17) [125929] FS: Curtis keyer chip, 8044ABM
by WA6GER@aol.com
- 18) [125930] FS Unbuilt Epiphyte3 -- 75 meter SSB Transceiver kit
by "Steve Blary" <steve@eclipsecat.com>
- 19) [125931] Re: FS (OT) - QRP rigs for sale

- by Dennis Doran <wb8wtu@yahoo.com>
- 20) [125932] OT: Surplus Rods - lost a few messages
by "Tracy Markham" <tracy@bytemark.com>
- 21) [125933] RE: FS Unbuilt Epiphyte3 -- 75 meter SSB Transceiver kit
by "Steve Blary" <steve@eclipsecat.com>
- 22) [125934] TINY-TORNADO Micro-Transceiver Kit Update
by "Brice D. Hornback" <bdh@cyberbound.net>
- 23) [125935] Update on Tuner for trade/swap
by Mercxx@aol.com
- 24) [125936] FS: DSP56002EVM dev. kit
by David Snowdon <norway@passport.ca>
- 25) [125937] St. Louis Vertical--Food for thought
by ARDUJENSKI@aol.com
- 26) [125938] Re: St. Louis Vertical--Food for thought
by "Ray Goff" <radioham@gmx.co.uk>
- 27) [125939] eQSL
by W2AGN <w2agn@w2agn.net>
- 28) [125940] OTish: the planets & OQRPP antennas
by "Rod N0RC" <rod@n0rc.com>
- 29) [125941] Re: St. Louis Vertical--Food for thought
by David Gauding <david.gauding@bbs.galilei.com>
- 30) [125942] Re: St. Louis Vertical--Food for thought
by Stephan Greene <sgreene@patriot.net>
- 31) [125943] Re: land grab?
by Bill Coleman <aa4lr@arrl.net>
- 32) [125944] Short antennas
by "Oleg V. Borodin" <master72@lipetsk.ru>
- 33) [125945] Re: land grab?
by Rick McKee <kc8aon@juno.com>
- 34) [125946] Trade: MFJ-941C Tuner
by NV9Z@aol.com
- 35) [125947] Parts needed 62 ohm 1/4 w.
by Tim Pettibone <k5oi@cox.net>
- 36) [125948] Help Please - Ten Tec KR5
by Casey Ray <clray@usc.edu>

Date: Thu, 02 May 2002 19:01:59 -0400
From: Paul Womble <pwomble1@tampabay.rr.com>
To: QRP-L <qrp-l@lehigh.edu>, FP List <fpqrp-l@mpna.com>
Subject: [125913] Those Pesky Texans
Message-ID: <3CD1C567.5ED1C230@tampabay.rr.com>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Received my first place certificate from the Armadillo Chase today in

the mail. Thanks guys for a fun event. Also thanks for the Team Cramp T-shirt!

If any of the Pesky Texans are going to be at FDIM stop by the Flying Pig table. I'd like you guys to autograph the certificate.

73

Paul K4FB

Date: Thu, 2 May 2002 19:07:12 -0400
From: "Ron Polityka" <wb3aal@fast.net>
To: ". QRP-L" <qrp-l@lehigh.edu>
Subject: [125914] Re: Flying Horse 2001 CD-ROM
Message-ID: <000901c1f22e\$181dad20\$69645cd1@wb3aal>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="Windows-1252"
Content-Transfer-Encoding: 7bit

Sold.

----- Original Message -----
From: "Ron Polityka" <wb3aal@fast.net>

> Hi,
>
> I have the Flying Horse Radio Amateur Call Book Winter CD-ROM 2001 for
> sale.
>
> \$20.00 and I will ship to your home.
>
> First e-mail will receive it.

72

Ron Polityka
WB3AAL
www.n3epa.org

Date: Thu, 2 May 2002 19:09:02 -0700
From: "Glen Leinweber" <leinwebe@mcmail.cis.mcmaster.ca>

To: <na5n@zianet.com>
Cc: "qrp-1" <qrp-1@lehigh.edu>
Subject: [125915] Re: Biasing MOSFETS?
Message-ID: <001a01c1f247\$7e7ff780\$07ea7182@mcmaster.ca>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

Paul suggest some great ways to characterize a MOSfet's biasing characteristics, when used as a RF power amp.

Paul also suggests some bad things that can happen when over-driving a MOSfet...one of which is saturation of the RFC choke feeding in DC power. Yes, that's bad, wasting power in heat (in the choke).

But you won't waste much power heating the FET. When you overdrive a MOSfet (gate voltage swinging up over approx +7v), it does turn on hard, and looks like a small, fractional-ohm resistor. But this only happens for a fraction of a microsecond. During that time, the MOSfet dissipates very little power, since its drain voltage is very nearly zero - same as the source. No voltage across the FET?...no power dissipated - even though there may be a lotta current running thru.

Yes, if you LEAVE the gate at +8v, current builds after a few microseconds and something soon gives up the smoke - maybe the FET, maybe the choke. But that's not how it runs in an amp - the FET only asks for current in short, sub-microsecond pulses. So Paul's smoky scenario when overdriving is not likely, if you stay within reasonable limits....

As long as the choke can stand the current, overdriving a MOSfet likely improves efficiency, making the FET run cooler. There'll be a bit more current in the choke, and a bit more current in the FET, but that's turned over to the filter between FET and antenna to be turned into useful RF power.

The real neat thing about a switching type PA, is that when the fet is hard ON, with its drain clamped firmly down at zero volts, its not dissipating much power. Yes, current is building in the choke, and you can't stay here too long. We'll only be here for half a cycle. Then the FET goes OFF - bang - current drops to zero and the drain voltage starts swinging up. But again, the FET dissipates no power, because there's no current thru it. Beauty! When its ON - little power

dissipated - when its OFF - no power dissipated.
Things aren't THAT perfect - the FET takes a bit of
time to switch ON & OFF. During that switching time
it dissipates power. And some of the drive power
coming in the gate goes into heat too. And when
its ON, that small ohmic resistance dissipates a
bit of power (an amp thru half ohm is half watt, and
for only half the time - a total of quarter watt).

Overdriving has limits: your gate voltage swing must
stay below a swing from +20 to -20 v, or you'll puncture
the gate oxide (blown fet). And overdriving too far
wastes drive power too.

Date: Thu, 02 May 2002 19:28:45 EDT
From: n5ib@juno.com
To: qrp-1@Lehigh.edu
Subject: [125916] birdie calculations
Message-ID: <20020502.172134.7503.0.n5ib@juno.com>

Does anyone have a program or maybe an Excel sheet that computes the
possible birdies on the basis of harmonics of the VFO and BFO?

72
Jim N5IB

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<http://dl.www.juno.com/get/web/>.

Date: Thu, 2 May 2002 18:37:20 -0500
From: "Pat J. Whelton" <pwhelton@hal-pc.org>
To: <n5ib@juno.com>, <qrp-1@lehigh.edu>
Subject: [125917] Re: birdie calculations
Message-ID: <008d01c1f232\$4ee98d20\$1905fea9@halpc.org>
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

That's easy. One less than par is birdie.

Hit 'em straight. Fairways and Greens.

Pat - KZ5J

<http://u1.netgate.net/~kirby34/rsg/wheltonp.htm>

----- Original Message -----

From: <n5ib@juno.com>

To: "Low Power Amateur Radio Discussion" <qrp-l@Lehigh.EDU>

Sent: Thursday, May 02, 2002 6:28 PM

Subject: birdie calculations

> Does anyone have a program or maybe an Excel sheet that computes the
> possible birdies on the basis of harmonics of the VFO and BFO?

>

> 72

> Jim N5IB

>

>

>

>

> -----

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Date: Thu, 2 May 2002 18:41:23 -0500

From: "w5tb" <w5tb@arrl.net>

To: "Low Power Amateur Radio Discussion" <qrp-l@Lehigh.EDU>

Subject: [125918] WTB Z-11 tuner

Message-ID: <001701c1f232\$df84e640\$0300a8c0@altn1.tx.home.com>

MIME-Version: 1.0

Content-Type: text/plain;

charset="iso-8859-1"

Content-Transfer-Encoding: quoted-printable

Anybody have an LDG z-11 they'd like to part with? If so please contact =
me off the list. TNX!

72, 73, oo T.E. 'Doc' Drake, W5TB

Arlington, Texas

FISTS # 5365 QRPARCI # 3532 ARRL Life Member K1 #181 K2#1617=20

Date: Thu, 2 May 2002 20:16:29 -0400
From: "Marty N5NW" <n5nw@n5nw.org>
To: "QRP" <qrp-1@lehigh.edu>
Subject: [125919] Nash Equilibrium and Antennas (was Re: Antenna Impedance)
Message-ID: <HJELK0JDNFAJGICJMIFGOEJBDEAA.n5nw@n5nw.org>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

First, I'm no expert in mathematics, particularly of the Nobel Prize variety. But as I understand it:

DEFINITION: Nash Equilibrium: If there is a set of strategies with the property that no player can benefit by changing her strategy while the other players keep their strategies unchanged, then that set of strategies and the corresponding payoffs constitute the Nash Equilibrium.

The equilibrium is utilized in economics to (in general terms) explain the behavior of markets with broadly competing objectives.

I suspect that the concept (particularly with game theory in general) might apply to antenna design, although the tradeoffs are a little more linear than economics.

I'd be interested in seeing someone apply the concepts to antenna analysis. A design having a Nash Equilibrium of 90 would really (in fact) be better than one with a Nash Equilibrium of 75. (the numbers, of course, are pulled out of the air, but represent the total payoff at equilibrium.)

de N5NW/8 (Marty)
Bellbrook, Ohio

Date: Thu, 2 May 2002 21:01:21 EDT
From: ARDUJENSKI@aol.com
To: qrp-1@lehigh.edu
Subject: [125920] Spartan Sprint?
Message-ID: <11d.107d2e28.2a033b61@aol.com>
MIME-Version: 1.0

Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

I know Russ was/is out of town in the boondocks. I am assuming Monday will be the usual Sprint night. I hope you have noticed there are a growing number of folks out of the Pacific Northwest participating. I am really excited to see the increase participation from here. Looking forward to working a bunch this time--73s

Alan KB7MBI in Woodinville, WA
FISTS 5702 Proud member of ARRL

Date: Thu, 2 May 2002 22:04:37 -0400
From: "Marty N5NW" <n5nw@n5nw.org>
To: "George, W5YR" <w5yr@att.net>, "QRP" <qrp-1@lehigh.edu>
Subject: [125921] RE: Nash Equilibrium and Antennas (was Re: Antenna Impedance)
Message-ID: <HJELK0JDNFAJGICJMIFGCEJDDEAA.n5nw@n5nw.org>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="us-ascii"
Content-Transfer-Encoding: 7bit

I don't really know how to frame the problem, either. In addition to determining how many players are in the game, the difficult part would be assigning payoffs for the various strategies, I'd imagine. But does the Nash Equilibrium apply in one-player games?

The various combinations of strategies and players are most easily understood spread in matrix form and with the value of various payoffs listed. At the equilibrium, the number (which in my case was completely arbitrary) represents the total payoff at that point. I don't know if the criteria is a strategy or in fact a player! Does efficiency compete with bandwidth, or does size compete with gain, or are they strategies? I really don't know. I do know that a given problem may have several equilibrium points.

It would be difficult to model (this is, after all, Nobel prize stuff!), however the concept of equilibrium seems to have some relevance in the effort to maximize the overall outcome as it relates to the balancing act between size, gain/pattern, bandwidth, takeoff angle, etc.

Or perhaps it doesn't apply at all. But that should be able to be proven as well. After all, if it finds use in business, there may be applications that haven't been considered. Makes me wish I'd finished a math degree rather than an accounting and finance degree!

73 es QRT de N5NW/8 (Marty)
Bellbrook, Ohio

-----Original Message-----

From: George, W5YR [mailto:w5yr@att.net]
Sent: Thursday, May 02, 2002 8:51 PM
To: n5nw@n5nw.org
Subject: Re: Nash Equilibrium and Antennas (was Re: Antenna Impedance)

Interesting, Marty, and thanks for the overview.

In antenna designs there are usually several avenues open for increasing bandwidth, usually stated in terms of an acceptable SWR range at the transmitter output. The approaches seem to belong to either of two camps: introduce additional loss to lower Q and thus increase bandwidth; and/or change the geometry of the antenna so that Q is lowered.

Examples are the now classic B+W folded dipole with the resistor to increase bandwidth and such geometries as the cage dipole which takes advantage of the fact that the diameter of a dipole element impacts Q and bandwidth. Other approaches involve stub compensation for off-resonant reactance, etc.

Obviously, one does introduce added loss in either case since the more wire present in the antenna structure, the more skin effect and ohmic loss, plus dielectric losses with coax stub compensation, etc. This would appear to be a situation where a zero-sum game outcome is inevitable.

At present, I do not see how one would frame the problem to simultaneously optimize efficiency and bandwidth in terms of your game theory approach, but perhaps you could tell us more next time. In particular, what does the numerical value for the N.E. represent?

73/72/00, George W5YR - the Yellow Rose of Texas
Fairview, TX 30 mi NE of Dallas in Collin county EM13qe
Amateur Radio W5YR, in the 56th year and it just keeps getting better!
QRP-L 1373 NETXQRP 6 SOC 262 COG 8 FPQRP 404 TEN-X 11771 I-LINK 11735
Icom IC-756PRO #02121 Kachina 505 DSP #91900556 Icom IC-765 #02437

Marty N5NW wrote:

>
> First, I'm no expert in mathematics, particularly of the Nobel Prize
> variety. But as I understand it:
>
> DEFINITION: Nash Equilibrium: If there is a set of strategies with the

> property that no player can benefit by changing her strategy while the
other
> players keep their strategies unchanged, then that set of strategies and
the
> corresponding payoffs constitute the Nash Equilibrium.
>
> The equilibrium is utilized in economics to (in general terms) explain the
> behavior of markets with broadly competing objectives.
>
> I suspect that the concept (particularly with game theory in general)
might
> apply to antenna design, although the tradeoffs are a little more linear
> than economics.
>
> I'd be interested in seeing someone apply the concepts to antenna
analysis.
> A design having a Nash Equilibrium of 90 would really (in fact) be better
> than one with a Nash Equilibrium of 75. (the numbers, of course, are
pulled
> out of the air, but represent the total payoff at equilibrium.)
>
> de N5NW/8 (Marty)
> Bellbrook, Ohio

--

73/72/00, George W5YR - the Yellow Rose of Texas
Fairview, TX 30 mi NE of Dallas in Collin county EM13qe
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QRP-L 1373 NETXQRP 6 SOC 262 COG 8 FPQRP 404 TEN-X 11771 I-LINK 11735
Icom IC-756PRO #02121 Kachina 505 DSP #91900556 Icom IC-765 #02437

Date: Thu, 02 May 2002 20:11:27 -0600
From: "James R. Duffey" <jamesd1@flash.net>
To: <n5nw@n5nw.org>, qrp-l <qrp-l@lehigh.edu>
Subject: [125922] Re: Nash Equilibrium and Antennas (was Re: Antenna Impedance)
Message-ID: <B8F74DEF.1496C%jamesd1@flash.net>
Mime-version: 1.0
Content-type: text/plain; charset="US-ASCII"
Content-transfer-encoding: 7bit

Marty - This looks very interesting.

Can you expound a bit more on how it applies to antennas? You alluded to
this in an earlier post. Would two strategies be efficiency and bandwidth?

Could a third be the requirement for multiband operation? Or say operation without an additional tuning apparatus?

How does one couch the requirements of the antenna to evaluate the payoffs?

Would it be possible for you to formulate a simple example of this type of analysis?

This sounds intriguing and is the sort of stuff that I like to see on QRP-L.
- Dr, Megacycle KK6MC/5

James R. Duffey KK6MC/5
Cedar Crest, NM DM65

Date: Fri, 3 May 2002 06:50:57 EDT
From: Mercxx@aol.com
To: qrp-l@lehigh.edu
Subject: [125923] Trade or swap
Message-ID: <da.1775d4a9.2a03c591@aol.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

Good morning,

I have for trade/swap a MFJ -971 portable antenna tuner. I would like to trade for a Z-match or any other smaller tuner or QRP gear (homebrew or whatever). The unit has never been out of the house clean no scratches dents or discoloration. I do not have the manual. Do not want cash just trading for something I can use (not even worried about a cost for cost swap). Thanks for the time and have a great day.

72
Steve N4TKP

Date: Fri, 03 May 2002 08:57:30 -0400
From: Ed Kessler <edkess@pa.net>
To: Low Power Amateur Radio Discussion <qrp-l@Lehigh.EDU>
Subject: [125924] Trade??
Message-ID: <5.0.2.1.0.20020503085050.00a020f0@mail.pa.net>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"; format=flowed

Good Morning,

I have an OHR Classic (20/40 meters) in excellent operational condition. The case has a few scratches, but can easily be repainted, if desired (it's black). The front panel is not scratched. There is no internal keyer; however, there is front panel and internal provision to install one. Manual included. This rig has a fine receiver.

I'd like to trade for an unbuilt transceiver (CW/SSB) kit. Let me know what you have, if interested. If the unbuilt kit is worth more, I'll throw in some cash.

73,
Ed AA3SJ

Date: Fri, 3 May 2002 07:40:33 -0700 (PDT)
From: Richard Fisher <ki6sn@yahoo.com>
To: QRP-L Reflector <qrp-l@lehigh.edu>
Cc: KI6SN@aol.com
Subject: [125925] Don't Miss Monday's May Spartan Sprint
Message-ID: <20020503144033.43102.qmail@web12107.mail.yahoo.com>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii

The Adventure Radio Society's May Spartan Sprint will be held on Monday evening, May 6, local time - our usual day and time period.

Spartan Sprints are two-hour contests sponsored by ARS, held the first Monday of every month. They are designed to encourage development and testing of lightweight radio gear suitable for outdoor human-powered QRP expeditions.

Start at 9:00 PM EST, 8:00 CST, 7:00 MST and 6:00 PST. Finish at 11:00 PM EST, 10:00 CST, 9:00 MST and 8:00 PST.

The frequencies will be 3560+- kHz, 7040 kHz+-, 14060 kHz+-, 21060 kHz+-, and 28060 kHz+- . (You may operate any number of bands - your choice.)

Exchange RST, SPC (state, province or country) and power output.

If you choose to call CQ, use the format "CQ SP," or "CQ QRP TEST."

You can take credit for working the same station on a second, third, or fourth band.

We report scores in two ways. The Skinny Division reports scores as a ratio of contacts to the weight of the station. The Tubby Division reports scores as the number of contacts.

"Station Weight" is defined as the combined weight of all transmitters, receivers, keys, keyers and batteries used during the Sprint. We use decimal pounds, rather than pounds and ounces. You may report your weight to the nearest 10th of a pound, or, at your option, the nearest 100th of a pound. For stations weighing less than one pound, we recommend the nearest 100th of a pound.

The Sprints are virtual expeditions. They allow a wide range of people to participate in this exciting branch of amateur radio, even if practical obstacles (like winter weather, health problems, or schedule conflicts) would make an actual expedition impossible. ARS announces each Sprint in three ways:

Most sprinters will operate from their home locations, but portable locations may be used. Transmitter output is limited to five watts or less.

We would like to motivate sprinters to develop and use radios that are packaged well enough for outdoor environments. Packaging is one of the legitimate elements of a great trail friendly radio, and we would like to see what kinds of packages are created by the remarkably creative Spartan Sprinters.

We have the Skinny and Tubby divisions, and you are free to choose between a monster radio, or a trail-oriented one. If you go for the second choice, we are asking you to package it so that it could withstand the rigors of outdoor life.

Sprinters are strongly encouraged to use our automated contest reporting system, which can be found in The ARS Sojourner. Participants may also e-mail their sprint results directly to the ARS Contest Manager, Russ Carpenter, AA7QU at: russ@natworld.com

Please submit your results by Wednesday afternoon after each Spartan Sprint. Contest results are reported by The ARS Sojourner, the QRP-L Internet Group, and in direct email to ARS members. If you email your results, please include the following:

- + Your full name and callsign
- + Date of the sprint
- + Total number of completed QSOs, and
The weight of your station
- + You may also want to add soapbox information, such as the equipment used, your operating location, interesting contacts, successes and

challenges.

You don't need to be a member of ARS to participate in the Spartan Sprints, but we would welcome your interest in becoming a member. Inquiries may be directed to ARS' membership chairman. His name and address are Richard Fisher, 1940 Wetherly Way, Riverside, CA 92506 (e-mail KI6SN@aol.com).

Do You Yahoo!?

Yahoo! Health - your guide to health and wellness
<http://health.yahoo.com>

Date: Fri, 3 May 2002 07:40:40 -0700 (PDT)
From: Dennis Doran <wb8wtu@yahoo.com>
To: qrp-1@LEHIGH.edu, wb8wtu@yahoo.com
Subject: [125926] FS (OT) - QRP rigs for sale
Message-ID: <20020503144040.51532.qmail@web12503.mail.yahoo.com>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii

For Sale - the following QRP rigs. Pics available for all, and complete manuals included. All outputs measured at 12 VDC supply.

SIERRA - this is the NORCAL VERSION.
Plain-Jane Sierra with ABX and
2 band modules:
40 meters - 2 watts output
30 meters - 1 watt output
One mod - a resistor/diode added to
the IF amplifier output to reduce
sidetone volume. The paint on the
front panel is crinkled in spots, but
not chipped. 150 khz tuning range.
\$165.00 + 1/2 shipping (\$3.00) CONUS

NC40A - this is the NORCAL VERSION. This is the
Norcal kit version "A" circuit board.
Case is black. Two pushbuttons have been
installed on the front panel by previous
owner to operate a now removed keyer.
Otherwise stock with a single turn pot.
Power output 2 watts. Tunes 7.025 to

7.054 - easily moved.
\$65.00 + 1/2 shipping (\$3.00) CONUS

SST-20 - Stock SST for 20 meter band. 50K RF
gain pot replaced with 10K pot. No
other mods. Power output 2 watts.
Tunes 14.055 to 14.062.
\$55.00 + 1/2 shipping (\$3.00) CONUS

SW40+ - Stock SW40+ with FreqMite audio
frequency annunciator built into
a Hammond case. Actually, built
into a shielded metal case that
is installed inside the Hammond
enclosure. Tunes 7.008 to 7.085
with a 10-turn pot. Output 2 watts.
\$60.00 +1/2 shipping (\$3.00) CONUS

Please contact me OFF LIST if interested or
have questions at WB8WTU@Yahoo.com
Inside/outside/front/back pics on all.

Thanks for the bandwidth.

73,
dennis
WB8WTU

Do You Yahoo!?
Yahoo! Health - your guide to health and wellness
<http://health.yahoo.com>

Date: Fri, 03 May 2002 15:15:14 GMT
From: na5n@zianet.com
To: qrp-1@lehigh.edu
Subject: [125927] More MOSFET stuff
Message-ID: <20020503151514.542.qmail@zianet.com>
Mime-version: 1.0
Content-type: text/plain; charset="us-ascii"

Gang,

Glen's post is excellent, and it addresses some of the discussion I have been having with several of you privately, worth repeating here.

This discussion began about questioning why a certain MOSFET PA was running so darn hot. This is usually an indication of poor biasing or overdriving the gate ... that is, for some percentage of the input RF, you are drawing full drain current. If this is a relatively small part of the input sinewave, it's usually not a problem. Helping people with their mosfet PA's over the years, particularly those who built the 38-Special add-on mosfet PA (which was initially poorly biased), the main problem I see is people increasing the gate bias to achieve maximum output power. Problem with this approach is when the input drive goes to zero, the gate may be sitting with 4v or so bias, sufficient to keep the mosfet drawing significant current. With full input drive, it may drive the gate into the 7-8v region allowing full drain current. With a SINEWAVE, if this full-drain current is occurring for too long each cycle, you can dissipate a lot of power within the mosfet, which if severe enough, will of course cause damage to the device. Therefore in my original post, I was trying to describe how to determine the useful dynamic range of a mosfet gate drive, since every mosfet tends to have it's own parameters.

A second point: while I mentioned that when entering the full drain current region, the drain-source resistance drops to about 0.4 ohms for the IRF510, this occurs ONLY for the period of time of full drain current, not all the time. The overall output resistance of the mosfet will be the AVERAGE of the resistances seen over each cycle, and thus will be a bit lower than the $RL = V_{cc}^2 / 2P_o$ value, not 0.4 ohms. Of course the longer you stay in the full drain current region, the lower your AVERAGE output resistance will be. Likewise, when in the full drain current region, drawing around 5A, the AVERAGE drain current for each cycle will be closer to the 1A (at 5W) level. Again, the longer you stay in the full drain current region, the higher the AVERAGE drain current will be, but will never be excessively above 1A average. The problem, however, is the momentary "spikes" of 5A drain current can put a large strain on the RFC feeding dc to the drain, possibly causing core saturation, and another set of problems for the PA and output filtering.

Keep in mind, the above is based on feeding the mosfet with a SINEWAVE input. The more efficient mosfet PA's, such as those discussed by Glen, are based on driving the mosfet with SQUAREWAVES. This helps assure that when the gate signal goes positive, driving the device into full drain current, the drain voltage is very close to 0V for very little heat dissipation in the device. This is difficult to achieve with a sinewave input, as there is a delay between the gate drive signal and the drain signal due to charging up the relatively large (150pF) gate input capacitance. With a square wave, you are charging up this gate capacitance

very quickly, while with a sinewave input, you are charging it more slowly, causing a longer delay, such that it is difficult to get maximum drain current to coincide with zero drain voltage for a very long. With a squarewave drive, max. drain current at 0V drain voltage can exist for 20-30% of the cycle, in effect, expending virtually no power.

With a sinewave drive, you vary the mosfet output power by controlling the peak-peak voltage of the gate drive. The more drive, the more output power (until you saturate in the full drain current region). With a squarewave drive, you control output power by controlling the duty cycle of the squarewave. That is, if the drive signal is "hi" for 10% of the cycle, you are drawing full drain current for only 10% of the time and a relatively low average output power results. Increasing the input duty cycle to 30%, means you are drawing full drain current for 30% of the time, for significantly more output power. This is called PWM, or "pulse width modulation" technique. In this case, we are not changing the pulse width fast for the purpose of modulating the carrier, but changing the pulse width on very slow time scales to change the output power. On a typical class E PA I have built using an IRF510, output power varies from about 3W to 9W by varying the input duty cycle from about 10-40%. Less than 10%, the mosfet gets unstable with high phase noise -- above 40%, drain current starts flowing so much of the time, you can stray away from having full drain current at 0V drain voltage, and thus the efficiency starts to suffer. In the 10-40% drive, efficiencies in the 80% range are seen. This means the IRF510 is comfortably warm even with several minutes of solid keydown. It also means it's drawing far less battery current to make 5W than a PA running 50%, obviously.

I'm glad many of you are finding this discussion useful and informative. Feel free to share with us your experiences. Mosfet's are fun devices, and capable of making a nice QRP PA in a properly designed circuit. And many of these points discussed by myself and others is why some people claim they are making 5W and the IRF510 is scarcely warm, while others are cooking eggs at 3W.

72, Paul NA5N

Date: Fri, 3 May 2002 11:35:52 EDT
From: K5BDZ@aol.com
To: na5n@zianet.com, qrp-1@lehigh.edu
Subject: [125928] Re: More MOSFET stuff
Message-ID: <158.d59c3c9.2a040858@aol.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

Paul's discourse is great! Hope some QRP pub picks it up for reprint and future library saving...

Bill K5BDZ

Date: Fri, 3 May 2002 11:54:24 EDT
From: WA6GER@aol.com
To: qrp-1@lehigh.edu
Subject: [125929] FS: Curtis keyer chip, 8044ABM
Message-ID: <7e.26f66b2d.2a040cb0@aol.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

Have three of these, new, left over from NorCal project. \$20 each postpaid.

jim, WA6GER

Date: Fri, 3 May 2002 11:54:17 -0400
From: "Steve Blary" <steve@eclipsecat.com>
To: "Low Power Amateur Radio Discussion" <qrp-1@Lehigh.EDU>
Subject: [125930] FS Unbuilt Epiphyte3 -- 75 meter SSB Transceiver kit
Message-ID: <PPEIIGOHKOAKJAPHAODHIECPDGAA.steve@eclipsecat.com>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="us-ascii"
Content-Transfer-Encoding: 7bit

Hello Everyone,

I have an unbuilt Epiphyte3 from the latest NORCAL kit run. It is still in the unopened bag with the documentation. Price is \$100 with CONUS shipping included.

73's
Steve Blary, N1XC

Date: Fri, 3 May 2002 09:22:58 -0700 (PDT)
From: Dennis Doran <wb8wtu@yahoo.com>
To: Dennis Doran <wb8wtu@yahoo.com>, qrp-1@LEHIGH.edu

Subject: [125931] Re: FS (OT) - QRP rigs for sale
Message-ID: <20020503162258.37517.qmail@web12507.mail.yahoo.com>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii

The SST20 and NC40A have been sold.
Thanks to all who inquired, and the bandwidth.

73,
dennis

Do You Yahoo!?
Yahoo! Health - your guide to health and wellness
<http://health.yahoo.com>

Date: Fri, 3 May 2002 09:40:41 -0700
From: "Tracy Markham" <tracy@bytemark.com>
To: "QRP-L" <qrp-l@lehigh.edu>
Subject: [125932] OT: Surplus Rods - lost a few messages
Message-ID: <NFBBKLDHALEHCJMAJPKFCELPDAAA.tracy@bytemark.com>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

I had an email foo-pah and lost some of your replies on ferrite rod
antennas.

It seems the inductance on these rods is too high for 7 MHz - I will be
testing the rods at 60 KHz and 165 KHz this weekend.

Tracy N4LGH

Date: Fri, 3 May 2002 13:07:00 -0400
From: "Steve Blary" <steve@eclipsecat.com>
To: "Low Power Amateur Radio Discussion" <qrp-l@Lehigh.EDU>
Subject: [125933] RE: FS Unbuilt Epiphyte3 -- 75 meter SSB Transceiver kit
Message-ID: <PPEIIGOHKOAKJAPHAODHGEDBDGAA.steve@eclipsecat.com>
MIME-Version: 1.0
Content-Type: text/plain;

charset="us-ascii"
Content-Transfer-Encoding: 7bit

Thanks to all those that inquired, but the kit is spoken for

73's
Steve, N1XC

> -----Original Message-----
> From: owner-qrp-1@Lehigh.EDU [mailto:owner-qrp-1@Lehigh.EDU]On Behalf Of
> Steve Blary
> Sent: Friday, May 03, 2002 11:54 AM
> To: Low Power Amateur Radio Discussion
> Subject: FS Unbuilt Epiphyte3 -- 75 meter SSB Transceiver kit
>
>
>
> Hello Everyone,
>
> I have an unbuilt Epiphyte3 from the latest NORCAL kit run. It
> is still in
> the unopened bag with the documentation. Price is \$100 with
> CONUS shipping
> included.
>
> 73's
> Steve Blary, N1XC
>

Date: Fri, 03 May 2002 12:29:52 -0500
From: "Brice D. Hornback" <bdh@cyberbound.net>
To: Low Power Amateur Radio Discussion <qrp-1@Lehigh.EDU>
Subject: [125934] TINY-TORNADO Micro-Transceiver Kit Update
Message-ID: <010001c1f2c8\$225ebe60\$6501a8c0@lwrnce01.in.comcast.net>
MIME-version: 1.0
Content-type: text/plain; charset=iso-8859-1
Content-transfer-encoding: 7BIT

Hello everyone. Time is running out to order a Tiny-Tornado kit. I'm not going to do nearly as many as last time. SO... if you want one... now is your chance. Every time I've done this in the past... someone always emails me after I finish taking orders and there isn't anything I can do about it. I'm only putting enough kits together to fill the orders... so please don't wait.

Check out the "Kits & Parts" page and place your order.

<http://www.QRPp-I.com>

Thanks!

73/72/71! de Brice KA8MAV
QRPp International Radio Club
<http://www.QRPp-I.com>

Date: Fri, 03 May 2002 14:11:39 -0400
From: Mercxx@aol.com
To: qrp-l@lehigh.edu
Subject: [125935] Update on Tuner for trade/swap
Message-ID: <6369F60D.7E674EAA.0004E6AB@aol.com>
Content-Type: text/plain; charset=iso-8859-1
Content-Transfer-Encoding: 8bit

The tuner has been spoken for thanks for all of the responses.

72
Steve N4TKP

Date: Fri, 03 May 2002 15:05:07 -0400
From: David Snowdon <norway@passport.ca>
To: QRP-L mail list <qrp-l@Lehigh.EDU>
Subject: [125936] FS: DSP56002EVM dev. kit
Message-ID: <3CD2DF632B2.E771NORWAY@smtp.passport.ca>
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit

For sale is a Motorola DSP56002EVM development kit. It contains all of the documentation, manuals, and software. I had originally planned to use this with the R2 DC receiver designed by Rick Campbell, but after three years I've decided that I just don't have the time to begin this project.

Also included is the 1997 TAPR cd-rom, which contains info on the EVM, and software to program the EVM for use as: audio DSP, digital modems and DTMF decoder.

I'm asking \$100US plus the cost of shipping. If you have any questions, please leave me e-mail at: norway@passport.ca

Thanks,
David VA3DKS

Date: Fri, 3 May 2002 15:11:57 EDT
From: ARDUJENSKI@aol.com
To: qrp-1@lehigh.edu
Subject: [125937] St. Louis Vertical--Food for thought
Message-ID: <197.664394b.2a043afd@aol.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

Running the programs made available by REG G4FGQ here are some efficiency results for 40m on a 20ft Black Widow pole:

St. Louis (original)----- 28 percent

St. Louis (W6MMA coil)--37 percent

Inverted-L (20ft by 20ft)---- 46 percent

These are using approximations with soil and coil info. What you can see you can get an increase in efficiency with the Inverted-L but not quite double over the original St. Louis Vertical which is less than 1/2 S-unit. I will let you put this in perspective regarding costs and designs and ease of use. I think side by side you would be hard pressed to tell the difference performance wise.

Me --well I have a soft spot for that coiled helix at the base of the pole (smile)

Alan KB7MBI in Woodinville, WA
FISTS 5702 Proud member of ARRL

Date: Fri, 3 May 2002 20:47:06 +0100
From: "Ray Goff" <radioham@gmx.co.uk>
To: "Low Power Amateur Radio Discussion" <qrp-1@Lehigh.EDU>
Subject: [125938] Re: St. Louis Vertical--Food for thought
Message-ID: <000c01c1f2db\$4effef80\$0100a8c0@starfishrcg>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

Hi,

All interesting stuff, I have been looking for a URL for the modified SLV with the W6MMA coil since this thread started, but I cannot find anything. Does anybody have a suggestion where to look?

72/73's

Ray G4FON

> Running the programs made available by REG G4FGQ here are some efficiency
> results for 40m on a 20ft Black Widow pole:
>
> St. Louis (original)----- 28 percent
>
> St. Louis (W6MMA coil)--37 percent

Date: Fri, 03 May 2002 15:50:43 -0400
From: W2AGN <w2agn@w2agn.net>
To: qrp-l@lehigh.edu, njqrp@njqrp.org
Subject: [125939] eQSL
Message-ID: <0205031550431C.04101@jsielke>
MIME-version: 1.0
Content-type: text/plain; charset=iso-8859-1
Content-transfer-encoding: 7BIT

I understand some folks used eQSL to send me a card after the recent DE operation. I am sorry, but I don't "do" eQSL anymore. Don't get me wrong, I liked the service, and all, but when they pulled that "Send \$1.00 and we'll mail you a QSL that the ARRL will accept," (but the ARRL didn't know they would accept them), I unregistered. A buck wouldn't have been bad, IF they were really acceptable, but since they weren't, I rather felt it showed a lack of honesty.

Be glad to QSL old fashioned way. SASE is NOT required. (nice, but not required).

No intention of starting flame war about eQSL, or ARRL not accepting them or whatever stockes your fire. This is just a PERSONAL preference.

--

John L Sielke W2AGN
w2agn@w2agn.net

<http://www.w2agn.net>

Date: Fri, 3 May 2002 14:05:51 -0600
From: "Rod N0RC" <rod@n0rc.com>
To: "Low Power Amateur Radio Discussion" <qrp-l@Lehigh.EDU>,
"Elecraft-list" <elecraft@mailman.qth.net>
Subject: [125940] OTish: the planets & OQRPP antennas
Message-ID: <000901c1f2dd\$ed3f5710\$6401a8c0@greyrock>
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

I wanted to write to all of you, and share a link to a story about the
upcoming planet alignment,
http://www.space.com/spacewatch/planets_align_020503.html; and some
useful maps at:
http://www.space.com/images/planets_guide_020503_02.gif But then I
realized it would be of topic so I won't.

Instead I just say: Listen for me MON night in the ARS sprint. There
has been lot's of talk lately about short vertical and other portable
antennas. I plan to set up my PW-1 SuperAntenna (same as MP-1 at
www.superantennas.com). Driving it will be my K2 at 5W powered by a
3000lb battery! (see
http://www.qsl.net/n0rc/foxhound_car/foxhound_mobile.html). So here's
a chance to evaluate with you our ears how such an antenna performs. I
plan on working 20 & 40m maybe even 15.

73, Rod N0RC
Ft Collins, CO

Date: Fri, 03 May 2002 15:22:38 -0500
From: David Gauding <david.gauding@bbs.galilei.com>
To: qrp-l@lehigh.edu
Cc: radioham@gmx.co.uk
Subject: [125941] Re: St. Louis Vertical--Food for thought
Message-ID: <5.1.0.14.0.20020503151227.02775790@bbs.galilei.com>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"; format=flowed

Hello Ray,

W6MMA ceased production of his coil mod for the SLV almost two years ago.

You can pretty much duplicate Vern Wright's mod with a homebrew tapped wire coil designed by AA0CW (ex-N0TFI). A keyword search should bring-up the URL for his website though the last time I was on it was well over a year ago.

The tapped wire coil uses a section of closed-cell foam pipe insulation as a coil form. It slips over the top of the pole and friction keeps it in place. Very light too. The foam insulation is already slit along it's length which eliminates doing any surgery on the form.

The tap is a simple extension at the base of the coil, terminated in an alligator clip. It's a wonderful project, real ham radio, and will work about the same as a commercial design.

If you can find a SLV/W6MMA kit that would be great. If not, the AA0CW homebrew coil will also do a fine job.

Good luck,

de Dave, NF0R nf0r@slacc.com

At 08:47 PM 5/3/02 +0100, you wrote:

>Hi,

>

>All interesing stuff, I have been looking for a URL for the modified SLV
>with the W6MMA coil since this thread started, but I cannot find anything.
>Does anybody have a suggestion where to look?

>

>72/73's

>

>Ray G4FON

>

> > Running the programs made available by REG G4FGQ here are some efficiency
> > results for 40m on a 20ft Black Widow pole:

> >

> > St. Louis (original)----- 28 percent

> >

> > St. Louis (W6MMA coil)--37 percent

Date: Fri, 3 May 2002 16:52:54 -0400 (EDT)

From: Stephan Greene <sgreene@patriot.net>
To: Low Power Amateur Radio Discussion <qrp-l@Lehigh.EDU>
Subject: [125942] Re: St. Louis Vertical--Food for thought
Message-ID: <Pine.LNX.4.44.0205031648590.22618-100000@tzion.greene.lan>
MIME-Version: 1.0
Content-Type: TEXT/PLAIN; charset=US-ASCII

On Fri, 3 May 2002, David Gauding wrote:

> You can pretty much duplicate Vern Wright's mod with a homebrew tapped wire
> coil designed by AA0CW (ex-N0TFI). A keyword search should bring-up the URL
> for his website though the last time I was on it was well over a year ago.

I did a google search and it appears that the website referred to is no longer active (<http://www.concentric.net/~jessqrp>)

I *did* find two articles in the QRP-L archives that appear relevant:

<http://qrp.kd4ab.org/2000/000809/0048.html> General posting (8/9/00) by N0FOR about the SLV, it's limitations, and enhancements.

<http://qrp.kd4ab.org/1997/970411/0001.html> Posting (4/11/97) from N0TFI describing the coil mod.

> The tapped wire coil uses a section of closed-cell foam pipe insulation as
> a coil form. It slips over the top of the pole and friction keeps it in
> place. Very light too. The foam insulation is already slit along it's
> length which eliminates doing any surgery on the form.

Hope this helps

73 Steve KA1LM

Stephan A. Greene sgreene@patriot.net ka1lm@amsat.org

Date: Fri, 3 May 2002 16:56:17 -0400
From: Bill Coleman <aa4lr@arrl.net>
To: <hamjoel@juno.com>,
 "Low Power Amateur Radio Discussion" <qrp-l@Lehigh.EDU>
Subject: [125943] Re: land grab?
Message-ID: <1020403165616.QAA28927@gate.iterated.com>
Mime-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"

On 4/19/02 8:58 PM, hamjoel@juno.com at hamjoel@juno.com wrote:

>Oh shucks now...

> first it's "we need meaux hams", now it's "the bands too
>crowded...."

>heck, recruit less hams then u got less crowding...

Doesn't work that way Joel. You recruit less hams, and it gets more and more crowded as our frequencies are taken away, one by one for other services.

Frankly, I don't see how we can recruit less hams than we are today. Influx of newcomers is awfully low....

Bill Coleman, AA4LR, PP-ASEL Mail: aa4lr@arrl.net
Quote: "Not within a thousand years will man ever fly!"
 -- Wilbur Wright, 1901

Date: Sat, 4 May 2002 01:11:44 +0400
From: "Oleg V. Borodin" <master72@lipetsk.ru>
To: "QRP-L" <qrp-l@lehigh.edu>
Subject: [125944] Short antennas
Message-ID: <002b01c1f2e8\$83b387c0\$9ae422c3@lipetsk.ru>
MIME-Version: 1.0
Content-Type: text/plain;
 charset="koi8-r"
Content-Transfer-Encoding: 7bit

Dear QRPers!

Does anybody knew some programmes for calculate size, inductance, efficacy of short HF antennas? Thanks for url!

72! de Oleg RV3GM/QRP

QRP-ARCI#10742
G-QRP#4690
QRPp-I#2
QRP-Master#50
etc.

Date: Fri, 3 May 2002 17:24:09 -0400
From: Rick McKee <kc8aon@juno.com>
To: qrp-1@Lehigh.EDU
Subject: [125945] Re: land grab?
Message-ID: <20020503.172446.3982.0.kc8aon@juno.com>

The problem with recruiting more hams is the fact that most of them come in as no-code techs and then they stay there. In my area, the bulk of the hams are no coders that keep saying they are going to upgrade but never do. I've heard excuses that the weather is either too cold or too hot to study, and my question is "Do these guys study outside?" I know of at least a half dozen no coders that have bought HF rigs and all they can do is listen to them and they bitch and moan because they can't use them ! Boy has our society gotten lazy in the last few years.

Rick McKee, KC8AON
Willow Wood, Ohio

QRP - Do more with less !

>
>Doesn't work that way Joel. You recruit less hams, and it gets more
>and
>more crowded as our frequencies are taken away, one by one for other
>services.
>
>Frankly, I don't see how we can recruit less hams than we are today.
>Influx of newcomers is awfully low....
>
>
>
>
>Bill Coleman, AA4LR, PP-ASEL Mail: aa4lr@arrl.net
>Quote: "Not within a thousand years will man ever fly!"
> -- Wilbur Wright, 1901
>

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<http://dl.www.juno.com/get/web/>.

Date: Fri, 3 May 2002 17:29:04 EDT
From: NV9Z@aol.com

To: qrp-1@lehigh.edu
Subject: [125946] Trade: MFJ-941C Tuner
Message-ID: <97.2705378f.2a045b20@aol.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

Hi QRPers!

For trade: MFJ-941C 30/300 watt tuner. Very good condition. Looking for an MFJ-901B, MFJ-16010, MFJ-971 or similar QRP tuner.

Please contact me off list at NV9Z@aol.com.

Thanks and very 72!

Chris Blaase NV9Z QRP-L #2370
Hagerstown IN

Date: Fri, 03 May 2002 17:33:58 -0500
From: Tim Pettibone <k5oi@cox.net>
To: qrp-1@lehigh.edu
Subject: [125947] Parts needed 62 ohm 1/4 w.
Message-ID: <5.1.0.14.0.20020503173040.009e82d0@pop.central.cox.net>
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"; format=flowed

Gang:

I finally did it. Transmitted into my QRP Plus Companion tuner in tune mode. Burned up a couple of resistors. In my NorCal stash I don't have 62 ohms. Anybody have a couple I can buy? Since I have the unit open am going to do the current mod so the battery doesn't go dead unless charging and up the charge current a bit as well. Haven't melted solder in awhile - fun!

Tim K5OI
Stillwater, OK

Date: Fri, 03 May 2002 15:40:49 -0700
From: Casey Ray <clray@usc.edu>

To: Low Power Amateur Radio Discussion <qrp-l@Lehigh.EDU>
Subject: [125948] Help Please - Ten Tec KR5
Message-ID: <3CD311F1.422ACD13@usc.edu>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Ten-Tec KR5 Keyer! Need schematic and parts placement pictorial. It's
the keyer with the S7476N chip.
It sends dits only and no dahs.
Any help is appreciated.
Thanks, K6HCJ
K6HCJ@juno.com

Sent for Marv as he is having problems connecting with the list.

Please contact Marv.

73 de Casey
AD6DI

End of QRP-L Digest 2544

